Sustainable agricultural intensification and its role on the climate resilient green economy initiative in Ethiopia

Report of the 3rd national platform meeting on land and water management in Ethiopia, Addis Ababa, 23–24 July 2012

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This is the report from the third meeting of the National Platform on Land and Water Management, 23–24 July 2012. The theme of the workshop was sustainable agricultural intensification and its role in the climate resilient green economy initiative in Ethiopia. The national platform is an initiative of the Nile Basin Development Challenge - http://nilebdc.org – in Ethiopia

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The Africa Research In Sustainable Intensification for the Next Generation (Africa RISING) program comprises three research-for-development projects supported by the United States Agency for International Development as part of the U.S. government's Feed the Future initiative.

Through action research and development partnerships, Africa RISING will create opportunities for smallholder farm households to move out of hunger and poverty through sustainably intensified farming systems that improve food, nutrition, and income security, particularly for women and children, and conserve or enhance the natural resource base.

The three projects are led by the International Institute of Tropical Agriculture (in West Africa and East and Southern Africa) and the International Livestock Research Institute (in the Ethiopian Highlands). The International Food Policy Research Institute leads an associated project on monitoring, evaluation and impact assessment.

Introduction

The workshop participants were welcomed by Dr. Iain Wright (ILRI Director General's Representative in Ethiopia) and Dr. Tilahun Amede (Nile Basin Development Challenge Leader.

The main objectives of the workshop were:

- Inform a wider audience about the national platform (what it is about, what it aims to do and how it relates to other projects such as Africa RISING);

- Introduce the four thematic working groups and their agenda for the coming months and gather feedback on their rationale and activities.

Presentations

A national platform for institutional learning and policy action on NRM in Ethiopia - Kees Swaans, ILRI

In Ethiopia, an integrated approach among various sectors such as agriculture, water, forests and food security is lacking although these sectors are all connected. Similarly, there is limited institutional capacity to respond to climate change and variability, and lack of systematic comparison of what technologies and approaches work where, when, and why. Weak institutional linkages, sectoral policies and fragmented investments deter cross-institutional learning, local action and policy implementation. The adaptive capacity of communities and the responsiveness of institutions to facilitate actions in NRM need to be integrated in the development and policy arena. It is therefore important to have a proactive platform for governmental institutions, NGOs, donors, private sectors and civil societies in Ethiopia to fill gaps and enhance collective action on NRM.

Sustainable tree-crop-livestock intensification as a pillar for the Ethiopian climate resilient green economy initiative - Aster Gebrekirstos, ICRAF and Kiros Meles Hadgu, Mekele University

High degradation, climate change/variability, population pressure and increasing food and energy demand are considered as some of the development challenges in Ethiopia. In sub-Saharan countries including Ethiopia cereal crop yield is stagnant. This low yield is associated with soil nutrient depletion and low amounts of fertilizer application. Some of the development challenges such as land degradation, crop productivity, livestock feed availability and food security are believed to be reversed in the Ethiopian highlands through sustainable intensification of mixed tree-crop-livestock systems on farms and within farming landscapes. The Ethiopian government initiatives on the Climate Resilient Green Economy (CRGE), *Faidherbia* Program (to establish 100 million *Faidherbia albida* trees on cereal cropland during the next four years and reforestation program (planting trees on 15 million ha of farm and communal land) are also expected to overcome the development challenges. The open grazing and post planting management are also a concern for the success of the government reforestation program. ICRAF is to be deeply engaged in supporting the CRGE especially the government's programs on watershed management and agroforestry.

The status of forestry development in Ethiopia: Challenges and opportunities - Wubalem Tadesse, EIAR

The economic contribution of the forestry sector was 11.6% of the country's total GDP in 1995 and 9% in 2005 whereas its economic contribution including watershed services was 27.5% in 1995 and 18.8% in 2005. If the value of wild edible plants, spice resources and services of protected areas taken into account, the percentage contribution of forests to the national economy can be much higher than the estimations from 1995 and 2005. A number of opportunities are emerging in Ethiopia that can be used to signify the roles and contributions of forestry. Some of these opportunities include: existence of forest policy; the Ethiopian government has signed a number of international conventions (Convention to Combat Desertification (CCD), Convention on Climate Change (CCC), Convention on Biodiversity (CBD) and Millennium Development Goal (MDG)), establishment of Oromiya and Amhara forest enterprises; and GTP and green economy targets. On the other hand, the sector is challenged by various institutional (lack of strong coordinating forestry institution), anthropogenic (deforestation and its consequence on depletion of high value tree species, deficit on wood supply and increase wood import, land degradation and siltation of dams) and database related (lack of data and updating on the status of the Ethiopian forests) factors. All development plans have to follow holistic and integrated approaches thereby all sectors including agriculture, industry, forestry and the whole environment support and complement each other to achieve the overall and sustainable socio-economic developments in Ethiopia.

Importance of Biodiversity for agricultural intensification and climate change adaptation in Ethiopia - Gemedo Dalle, Institute of Biodiversity Conservation

Biodiversity is crucial to human wellbeing, sustainable development and poverty reduction. It contributes directly through provisioning, regulating and cultural ecosystem services, and indirectly through supporting ecosystem services. Biodiversity gives freedom for choice and is the foundation of ecosystem services to which human well-being is intimately linked. It is necessary to improve sustainability and cope with climate change. Biodiversity conservation is part of the solution to climate change. Agricultural biodiversity contributes to improved pest and disease control, nutrient availability and water use and increased yields and the production of food with better nutritional content. Agricultural intensification can be accomplished only if biodiversity is better conserved and managed. Harmonizing intensification and sustainability is fundamental. Intensification may affect sustainability unless care is taken to address issues of small holding farmers. One possibility for increasing the yield potential of traditionally farmed lands is plant breeding, another is increasing on-farm species diversity. These are key steps to improving food security. Proper valuation of ecosystem services and proper implementation of international convention that Ethiopia has accepted can step up the management of biodiversity.

Contribution of traditional agroforestry (TAF) to climate change adaptation and mitigation in Ethiopia - Zebene Asfaw, Wondo Genet College of Forestry and Natural Resources

Traditional AF practices are prominent in different parts of Ethiopia. The Gedeo homegarden AF practices, the rift valley parkland Faidherbia albida and the Konso *Moringa stenopetala* based AF practices are some of the TAF that can be mentioned as good examples in Ethiopia. Tradional AF practices play significant roles in landscape connectivity, soil nutrient cycling and conservation agriculture, watershed management, income generation to sustain livelihoods, shade for high value crops such as coffee, climate change adaptation and carbon sequestration, none forest product and livestock fodder sources. Traditional AF has diversified tree, crop and livestock components and this diversity can make it key to intensification. Therefore, Intensification of agriculture should also give emphasis to already existing AF practices and systems. There is also a need to explore the potentials of tree row, water break, pasture with plantation forestry, aquaforestry and protein bank AF practices for sustainable agricultural intensification and coping with climate change.

Forest policy, strategies and laws of Ethiopia: Opportunities and challenges to developing the sector - Melaku Bekele, Wondo Genet College of Forestry and Natural Resources and Habtemariam Kassa, CIFOR, Addis Ababa

Forest policy is a process; it is always in the making. It has a historic and future dimension. But, in the Ethiopian case it seems that efforts on forest policy and its implementation have come back to “square one”. The Italians initiated extensive forestry program (1936-41) but this was forgotten after liberation. The Imperial government allowed state, private, and communal ownership of forests but extensive deforestation took place for agricultural expansion. During the military government, the State maintained ownership that discouraged effective community and individual participation in forest development. A huge institutional and organizational vacuum was created from mid 1990s onwards as the State somehow moved away from forestry. Major changes in political orientation and frequent institutional changes did not allow the evolution of mature forest policy. Nevertheless, the forest policy of Ethiopia was released in 2007. However, there are no comprehensive directives to implement policy and proclamation on the ground even five years after. There are also several other policy statements, legal frameworks, good sectoral plans/programs and initiatives that support the forestry sector. For example, The CRGE strategy identified forestry as one of its four pillars. Therefore, capable and more efficient organizations and teams are required to coordinate national efforts and to effectively handle international negotiations/agreements and to mobilize resources. Similarly, a co-managed and co-owned national data base is needed to track changes in forest resources and to compose experiences, facts and figures for policy revision, research and education purposes. Establishing a regular discussion forum of “wise men” will be important to reflect on past experiences (in Ethiopia and elsewhere) and on policies and their implementation so as to inform forestry development in Ethiopia.

Genesis of climate resilient Highlands transformation - Kelali Adhana, Tigray Science and Technology Agency

Climate resilience is the ability to cope with, and manage the change brought by weather stresses and shocks. A climate resilient economy is one which is protected against the negative impacts of extreme climate events, normally referred to as the weather, and climate change so that the well-being of the people and the economic growth and prospects of the country are not damaged by the impacts. Climate change will impact on all aspects of Ethiopia's economy, and particularly on health, infrastructure/ transport, agriculture, natural resources, energy and industry sectors. Climate resiliency has tremendous dimensions and the impact goes accordingly on environment (environmental resilience, Biodiversity resilience), social (community resilience, knowledge resilience) and economy (resilient infrastructure). Resilience should be meant principally to address these dimensions amongst others. Climate action plans will identify opportunities for mainstreaming climate change into sectoral and regional development strategies.

In the Ethiopian context, a significant number of highland communities are sensitive to climate change and some are considered to be potentially at risk. For many highland communities, climate change represents a major threat in relation to land degradation, increasing temperatures, changes in seasonal rainfall variability which is impacting these communities in many ways, including through changes in plant and animal populations. The Ethiopian highlands are highly disturbed, and the level of the disturbance can be measured by ecological response of animals and plant species, reduction in water flow originated from highlands and siltation in downstream dams. Therefore, the connectivity of the upstream communities and downstream communities in terms of the impacts of climate change can be realized very easily. Generally, what matters for the highlands matters for the lowlands. Communities may have considerable scope and resources to plan for and adapt to such change. However, without effectively coordinated planning and action at national, state and local levels, the potentials of resilience may not be realized. Opportunities emerging from climate change include carbon abatement and sequestration, solar and wind farms, biodiesel, and others. These opportunities can ensure creation of green jobs across highlands and elsewhere. The issues that need to be considered in relation to climate change include: identify technology options and devise policies that help smallholders to grow food, care for the earth and improve their livelihoods in the process; define role of local and indigenous knowledge in facilitating climate change adaptation in the Highlands; review climate change from the problems and the solutions; and calibrate/recalibrate program interventions to fit existing and future challenges.

Information needs for adaptation to and mitigation of climate variability and change - Girma Balcha and Gebru Jember, Climate Change Forum-Ethiopia

Climate variability is fluctuations in the climate at different time scales or a fluctuation of climatic parameters from the normal or base line values whereas climate change is a change in the long term means value of a particular climatic parameter. It is a persistent long-term change. Climate affects almost all wakes of life including agriculture (food security), water supply, health and energy supply. Some are more sensitive than others. Potential impacts of climate change include shorter length of growing period (days to maturity) and a decrease in crop yield; decrease/increase in runoff (water availability); expansion of horizons of Malaria areas (human health); and change in ecosystems and impact on development. In the case of Ethiopia, climate variability has contributed more to the deep rooted poverty. Currently temperatures are increasing but rainfall is highly variable. Future projections show that rainfall will increase in Ethiopia. Managing climate variability will help reduce vulnerability and pave the way for adaptation to climate change. Climate information (vulnerabilities, uncertainties, interventions and institutions) and policies (early warning systems, insurance and credit) are very fundamental to deal with the impacts of climate variability and change on development and resource-management problems. There are limited numbers of met stations (About 1100 conventional surface stations and 35 automatic weather stations). As a result, there is a gap in data spatial and temporal coverage, gap in data availability and accessibility and gap in data quality. In this case modeling can be a solution.

Sustainable agricultural intensification in the Ethiopian Highlands - Tilahun Amede, ILRI-IWMI

Sustainable agricultural intensification is defined as producing more output from the same area of land while reducing the negative environmental impacts and, at the same time, increasing contributions to natural capital and the flow of environmental services. A sustainable production system would consider most or all of the following elements: understanding systems and the clients, improving water storage and productivity at farms, landscape and basins, improved soil fertility management, improved germplasm, reversing biomass scarcity, landscape approaches for intensification and CC adaptation, enhancing institutional capacity, and scaling up/ scaling out/ scaling down best practices and approaches.

Group discussions on cross-cutting issues

The workshop organizers identified four topics for group discussion on the current status, gaps and suggestions for improvement. The four topics were seed and seedling systems (private, community, public); incentives to integrate trees into crop and livestock systems (policy, market, food security, etc); interventions/post-plantation management/niches; and open grazing and collective action.

Seed and seedling systems

The main actors in the seed system include higher learning institutions, FRC, genebank, BoAs, state forest enterprises (Amhara/Oromia), NGOs, private vendors, farmers (coops) and regional seed centers (SNNP, Amhara, Oromia, Tigray). These institutions/actors are directly or indirectly involved in seed collection and conservation, seedling production, community mobilization and facilitation.

Gaps that came out from the group discussion are haphazard management of seed and seedlings; lack of feedback loop between seed suppliers and users; gap on the knowledge of propagating trees; unbalanced national seed/seedling demand and supply; lack of capacity in terms of inputs (seeds/nursery sites/management manuals for trees) and inadequate budget allocation for state run nurseries.

The suggestions to improve seed and seedling system focused on capacity building in tissue culture, establishment of market oriented seed system, the need for research on propagation behavior of some tree species, seedling production based on agro-ecologies and economic importance, production of nursery manual for each of the tree species and creation of proper tree seed, seedling and nursery database.

Incentives to integrate trees into crop and livestock systems

The group discussed the topic from policy, market and food security aspects. They also identified gaps. Integrating trees into crop and livestock systems require incentives and the incentive mechanisms demand policy support. There should be also mechanisms and agencies to make incentives on integrating trees into the crop and livestock system real. The products from the tree-crop-livestock system should be also linked to markets as part of these incentives. Poor sectoral integration, absence of tree technology packaging and weak extension on tree based innovations were identified as gaps to promote incentives for integrating trees in the crop and livestock system.

Interventions/post-plantation management/ niches

The tree planting campaign was one of the main discussion topics. Huge numbers of seedlings (millions and billions) have been planted. On the other hand, the survival of the trees is not properly evaluated and reported, and model woredas where this campaign gave results are not seen. Pockets of success stories exist, but networking and partnership as an instrument for scaling up is not utilized. So far, tree planting around the homesteads is more successful than tree planting on other niches. The homestead planted trees are better protected from free grazing system. Species selection for right agro-ecology and right management has not been adequately practiced. It could have been also important to clearly define ownership of the planting areas. Defining ownership helps to have appropriate follow up on planted trees and shrubs. The group finally suggested to clearly defining ownership of planting areas (private/communal), prepare tree based technology packages based on proven scientific evidence, build capacity of implementers (DAs) and strengthening linkages between research and extension.

Open grazing and collective action

Open grazing is a challenge for sustainable land management, biodiversity and climate change resilience. Livestock destroy soil and water conservation structures and trees and shrubs during free grazing. Collective action is required to halt free grazing systems. Hillside enclosures are successful almost throughout the country although there have been still some constraints in governance, community ownership and sustainability. Farmland enclosure has not been well adopted yet by all regions and woredas except for some good experiences in Adama and Tigray. Some of the strategies that help to control free grazing and facilitate area closures include: application of the good experiences in Adama, Amhara and Tigray; adopting the zero grazing experiences of Harergie Zones; community empowerment and ownership; development of alternative livestock feeds; creating business/market oriented farmers (livestock fattening, dairy development, income diversification of farmers and establishment of incentive mechanisms to avert risks).

Panel discussion on sustainable agricultural transformation in Ethiopia: What should be done in the coming 5 years?

Discussants were Professor Zerihun Woldu (AAU), Dr. Kidane Georgis (EIAR), Dr. Kelali Adhana (Science and Technology, Tigray), Dr. Tsegaye Bekele (WFCNR), and Dr. Mulugeta Berhanu (REST). The panel discussion was chaired by Dr. Habtemariam Kassa (CIFOR).

Panelists were asked to give views and suggestions focusing on policies, institutions, capacity building needed and specific interventions and support to the private sector. According to Professor Zerihun population pressure, shortage of cultivable land and water, climate change and low soil fertility contributing to low level of productivity and production. Price based production has also its own implications. In some places, farmers are encouraged to produce high price crops. In this case the focus is export rather than food security. Some of the possible interventions to transform agriculture in Ethiopia include: Biotechnology in its restricted sense (gene technology), improved plough technology (mechanization), fertilizer production, water harvesting and using equitable share of water and strengthening institute of biotechnology. We also need an academy of science that can support the institute of biotechnology.

Dr. Kidane Georgis stressed the importance of strengthening NRM in terms of research and budget. We cannot increase production unless we work and give emphasis on NRM. Crop varieties can give good yields if they are supported by management or agronomic practices. There must be also strong forestry institutions. He also suggested giving much attention to integrated/holistic rather than commodity approaches, as well as watershed management approaches. Watershed integrates crop, livestock, trees, water and other biophysical and social components. As far as institutions are concerned, he suggested strengthening coordination among federal institutions, NGOs, regional institutions; establishment of dryland and rangeland management institutes. According to him, gaps on the following issues need to be bridged as early as possible: limited research on camels; lack of capacities – people who are trained in resource management economics, agricultural engineering and hydrology are few; there is a need for modern techniques like GIS and remote sensing but the staff are very few; foresters are few which needs to increase; we have few economists that deal with policy research; and climate change which is also a global challenge and not much has been done about it.

Dr. Tsegaye Bekele emphasized his thoughts on the lack of sectorial integration at all levels (each institute focuses on its own routine activities), lack of focus on dealing with non-farm activities, lack of participation of different stakeholders during policy (forestry) discussion, markets are not brought to the table but it needs to be intensified; institutions are there but they are not strong. Institutional arrangements are not good. Who is responsible for what is not clear. He also suggested having soil mapping initiatives, demand driven and problem solving research and quality inputs with reasonable price.

Dr. Kelali Adhana underlined the importance of political will before formulating policies. The government of Ethiopia is allocating resources to various institutions. The resource should be also well managed. He questioned whether innovation is going in an organized/integrated or scattered manner, our policies contribute to the micro or macro economy, we consult stakeholders along the way and whether we design policies based on feedback. Finally, he recommended: market system should be competitive; there should be specialization in higher intuitions; standards should be established for all; research and development interventions should be intensified; and science and technology should get attention.

Dr. Mulugeta Berhanu focused his points on communal and farmlands. According to him ownership of the communal land should be defined. In most cases, trees are planted in communal lands. The farmlands are degraded due to continuous crop production. The farmlands need transformation. Trees should be also integrated in the farmlands. In this case, there is a need to establish incentive mechanisms for farmers to plant trees on farmlands. He also suggested shifting from tree planting to tree growing; integration of the forestry and water sector to make landscapes green; convert the degraded catchment to fruit growing catchment; and organize unemployed forces on forest (use the cobblestone model for forestry).

Conclusions and recommendations

The issues of lack of quality data and data source, absence of strong forestry institution, the need to give much emphasis to small-holders and indigenous knowledge, lack of proper valuation of forests/biological resources to ecosystem services, cross-sectoral integration, community participation in the decision making, and up/out-scaling of good practices were cross-cutting issues in most of the presentations. The reasons why farmers are not adopting some of the good practices, and the challenges to implement agroforestry were suggested as areas for further study.

The issues below were identified as critical to help uplift the economic, environmental, ecological and social contributions of trees in Ethiopia.

Technological/germplasm issues

Agro-ecologies, farming systems and socioeconomic conditions of farmers in Ethiopia are highly diverse. On the other hand, tree related technologies that are compatible with various tree growing niches and which fulfill the interests of farmers are less available. There is a need to properly identify the demand of the farming communities, properly cluster the growing niches, and make accessible technological options (germplasm, management and utilization) that provide various demanded products and services.

Data/information related issues

There is a lack of up-to-date tree-related data/ information that facilitates proper planning and the management of various tree species. Propagation, seed treatment and germination information for many of Ethiopia's indigenous trees are lacking. Therefore, a co-managed and co-owned national tree database is needed to track changes in this valuable resource, compile the indigenous knowledge/experiences on tree farming, and provide facts and figures for research and education purposes.

Capacity building

Capacity building in-terms of facilities and human resources development is essential to maximize benefits from tree and shrub species. Turnover of technical staff from research, extension and higher learning institutions is apparent in different parts of the country. This creates discontinuity in tree-related research and development initiatives and activities. Incentive mechanisms that attract productive forestry/NRM experts and researchers could be designed and implemented. The capacity building efforts for development agents (government extension workers) should be practically oriented to enable them properly respond to the information and technology demands of farmers at the grass root level. Farmers practice tree related technologies and information with confidence when these have been practically demonstrated to them.

Developing a holistic/integrated approach

Farmers have their own holistic/integrated approach to farm management to solve farming system constraints. The research and development system should also follow a similar approach to back up farmers with improved technologies and innovations.

Institutional issues

The institutional arrangements in the forestry sector have been unstable and suffer from frequent restructuring. The lack of a stable organizational structure for the sector is often cited as one of the bottlenecks to properly coordinate forestry research and development, and bring effective and long-term management and development successes in Ethiopian forestry. Therefore, capable and more efficient forestry institutions are required to coordinate national efforts and effectively handle international negotiations/agreements and mobilize resources.

Policy related issues

The Forest Policy of Ethiopia was released in 2007. However, there are no comprehensive regulations and directives to implement the policy on the ground. The issue of free livestock grazing is another challenge to integrate high value tree and shrub species/fruit trees in the agricultural outfields. It is not uncommon to see cattle, equines and small ruminants grazing freely on croplands and other potential tree growing niches. Livestock cause considerable damage to young planted and naturally grown trees while freely grazing. Therefore, the problem of free grazing requires policy intervention and technological innovation that accommodates the interests of all.

Closing remarks by Adane Kassa (Director, Water Action)

It is indeed an honor and a privilege for me to be able to give brief closing remarks in this crucially important national dialogue on sustainable agricultural intensification and its role on the climate resilient green economy in Ethiopia. During the last two days, we have been able to see the interconnection of agriculture, water, forests and food security and also seen the logic and justification for the need to emphasize on integration. We have gone through what we mean with sustainable agricultural intensification, what the forest policies and strategies in Ethiopia look like and the gaps that exist. In this important workshop we also saw the importance of biodiversity and the contributions of traditional agroforestry to agricultural intensification. We were able to see the genesis of climate resilience highland transformation in Ethiopia. The importance of natural resource protection and development has been underlined. Finally we also saw through a very clearly presented account of the sustainable agricultural intensification in the Ethiopian highlands.

Most importantly and as part of the solution to the various problems that we have detailed in the different themes of the dialogue, the idea of building our common platform (the national land and water platform) has been stressed. We have been able to share available information on the important themes of the dialogue and I must say the dialogue was extremely successful in conducting such a resourceful dialogue. The dialogue helped very much to identify the gaps in each one of the themes. Most gaps look to converge in many aspects. The most important of these being the plausibility and availability of data and the issue of ownership. The solution ahead has been expressed to be working in a united front.

The logic behind agriculture, water, forests and forest security are interconnected thus justifying harmonization and working together in an integrated manner. We have seen in the presentations and discussions that followed that our institutional linkages are weak thus justifying to work through the platforms. The platform will stimulate sharing and learning like this dialogue, guide evidence based on policy formation, enhance effective coordination, address institutional and policy constraints, build institutional capacity and will enable scaling up and scaling out of best practices through strategies of participatory decision making learning and documentation.

The structure of our platform (national land and water platform) has been put in place at national level with national steering committees. Thematic working groups have been formed and are undergoing their tasks. My plea is for all our institutions to contribute their share in the strengthening and smooth working of the platform for the cause of successful contribution of the platform to security and alleviation of poverty in Ethiopia.

Let me take this opportunity to express our deepest appreciation and sincere gratitude to NBDC. Its outstanding contributions for the establishment, development and sustenance of the national land and water platform and its thematic working groups are commendable. Our sincere appreciations also to ILRI and IWMI for their fruitful collaboration. Last but not least I would like to thank those who collaborated in giving presentations for the dialogue and all of you participants who gave your time and energy to this important dialogue.

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